

DESTROYING THE UROGENITAL DIAPHRAGM OR PELVIC FLOOR AS A MEANS OF RELIEVING PROSTATIC ISCHURIA: A NEW OPERATION.

BY E. WYLLYS ANDREWS, M.D.,
OF CHICAGO,

Professor of Surgery in the Northwestern University Medical School; Surgeon to Mercy
Hospital, Michael Reese Hospital, and Cook County Hospital.

PROSTATECTOMY is a disappointment in one respect. It has become a fairly easy and rapid operation, but it causes too many deaths. This makes it advisable only in selected cases. The great majority of prostatic patients get on so well under other measures that the risk of prostatectomy is far greater than the risk of palliative, non-operative management.

What is needed to popularize any operation here is to find a radical-cure method, practically free from risk of death and of complications, such as rectal and perineal fistulas.

The ideal method would leave the urinary tract unopened, and would, therefore, involve no more risk to life than, say, herniotomy, the removal of a lipoma, or any moderate external operation usually called safe in absence of organic disease. There is nothing in our experience to warrant the hope that we will open the bladder as we now do the peritoneum with virtually no risk. Nobody of much experience claims that a long series of cystotomies can be performed without a regular percentage of deaths. If he claims immunity from risk in opening the bladder, even in good subjects, he cannot show any large series of cases to prove it. All the care and antisepsis known have not made lithotomy take the place of lithotrity in percentage of recovery. I have known a number of good operators who thought it was going to do so, judging by the triumphs of antiseptic surgery elsewhere, and by a small series of successful cases with careful technique, but each one of these has met later his fair percentage of deaths, and the question stands exactly where it did before. Open operations

still have the greater mortality, if we may judge from the very extensive reports of the East Indian surgeons, many hundred stone operations being reported by individual surgeons.

If a method of dividing or relieving the prostatic ring entirely from without could be perfected, probably, instead of 5 or 10 per cent., the mortality would be less than 1 per cent., and our aged patients would be kept but a few days recumbent as against several weeks by present methods.

We are not accustomed to consider the male pelvic outlet as of surgical importance, but we must now revise our ideas of pathogenesis and treatment of prostatic obstruction, if my theories are true, and concede that the bones and ligaments of the pelvis also have much to do with compressing the urethra

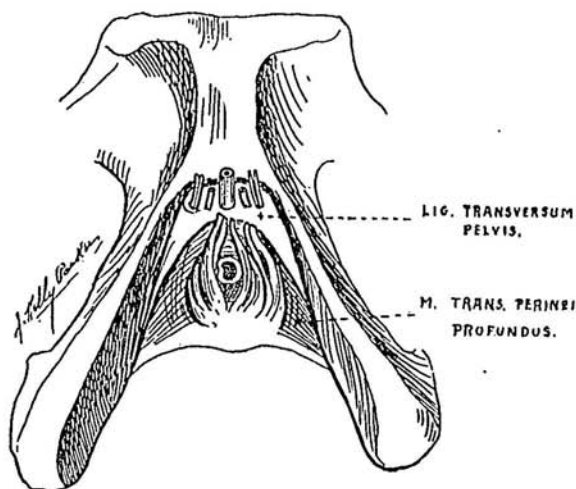


FIG. 1.—Immovable anchorage of the prostate. Ligamentum transversum pelvis. Vessels and urethra perforating.

in prostatic ischuria. Unless there is crowding together of the walls of the prostate by outside pressure, enlargement alone will not cause stoppage. Were the prostate free to expand laterally instead of into its own lumen, enlargement of the

organ would seldom cause dysuria, as the vesical sphincter is not a part of it. At any rate, many very large prostates have come under my notice in which there was no retention and no cystitis. A much smaller one, bound tightly against the pubis and subject to lateral pressure from the pubic rami, will often give complete obstruction. The organ, when enlarged by myomata or hypertrophy (like a myomatous uterus), lacks room in the bony pelvis, and crowds all the other organs and itself until it obstructs its own canal.

The prostate sits in a rigid triangle, having one side of ligament and two of bone. It is exceedingly firmly fixed in this narrow box by the short, hard band called the triangular ligament and the two prostato-pubic ligaments. These effectually prevent any backward motion into the looser and wider space behind, except in so far as the ligamentous fibres can stretch. The triangular ligament (ligamentum transversum pelvis) also forms a perfectly rigid floor, on which the organ is firmly seated and through which the urethra perforates, thus establishing, immovably, the position of neck of the bladder, prostate, and bulb.

A consideration of these anatomic and pathologic points led me to devise an operation for cutting loose the gland from its pubic and lateral ligaments, and partial destruction of the pelvic floor or urogenital diaphragm, with dislocation backward of the whole mass. This means such a radical departure from the old technique that a few words of explanation seem necessary.

About three years ago ("Infrapubic Section," *Journal of the American Medical Association*, October 18, 1902) I described an operation for doing this. I have now modified it, and I think improved the technique, and in a number of cases omitted incising even the capsule of the prostate, relying solely on its backward displacement to effect a cure of the obstruction.

The operation may be called a prostatolysis or displacement of the organ from between the jaws of the pubic rami to a looser position behind and below. This involves the practical destruction of the urogenital diaphragm to the extent

that it no longer forms a transverse musculo-ligamentous septum or floor holding and compressing against the bone, the neck of bladder, and pars prostatica urethræ.

TECHNIQUE OF OPERATION.

I have found only one incision really serviceable for this operation, although I considered three routes which seemed possible, viz.: (1) Suprapubic; (2) transpubic by symphysiotomy; (3) infrapubic, *i.e.*, in front of the urethra.

The suprapubic barely enables one to touch the prostate before opening the bladder. I experimented in doing ordinary

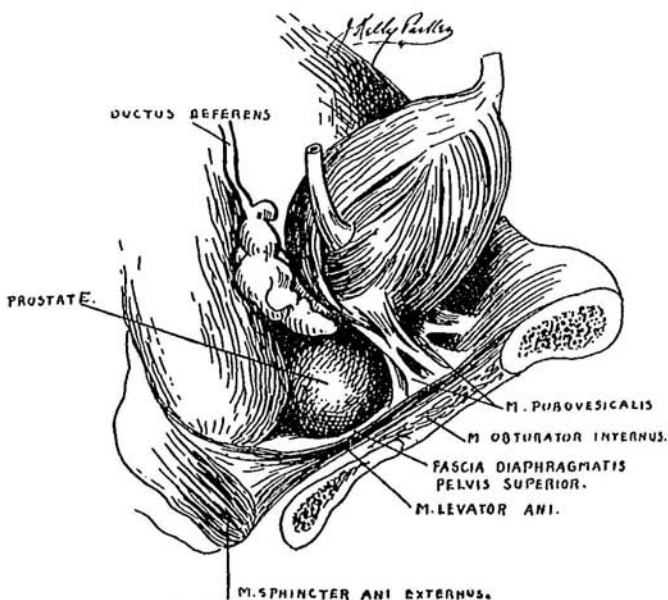


FIG. 2.—Prostate in its bony ligamentous box, supported by urogenital diaphragm.

suprapubic cystotomy, and easily found this out. Although the bladder separates very easily from the bone, I do not deem it a safe region to work in because of the dorsal vein and accompanying vessel just underneath the symphysis. These

same vessels I encountered from below, but I could there see and avoid cutting them. The transpubic or symphysiotomy route I considered too much in the category of a capital operation.

I started with the idea of an incision under the symphysis, a drawing apart of the two cords and detachment of the penis by severing the pubic attachments. This I tried on a cadaver, thinking I could then draw the neck of the bladder well down and have the prostate quite accessible. I was disappointed to find less access than I had hoped for in the cadaver, and I feared to try it in the living subject on account of danger to the dorsal vein and arteries of the penis.

If the right or left spermatic cord be drawn well forward, an incision about 8 or 10 centimetres long can be made from the symphysis parallel to the right or left ramus of the pubic bone. This gives a fair opening, but for safe and satisfactory work I have devised the large opening shown in Fig. 3, made by first pushing up the testes and holding them out of the scrotum with a truss or binder, and then cutting the skin and fat in a curved flap corresponding with the pubic arch. Any amount of room can thus be obtained, and all the structures of the perineum freely exposed. The apex of this flap is the pendulous portion of the penis. When traction is made, the opening becomes diamond-shaped, and shows the following structures from the symphysis backward (Figs. 1 and 2): (1) A space of fat about one-half inch wide; (2) the ligaments attaching the penis to the pubis, and the prostato-pubic ligaments between which pass (3) the crura of the corpora spongiosa each side; (4) a large vein, the dorsal vein of penis, with two smaller arteries and two nerves. The fibres of the levator ani muscle, embracing the prostate and the inner surface of the obturator internus, come forward in the lateral part of the field, and the deep fascia fills the whole space with a strong covering, which must be cut away in front before we get inside the pelvic floor. The internal pudic artery, and particularly a large branch to the bulb, must be avoided in doing this.

After pushing aside the vessels here encountered and dividing the pubic ligament of the penis (Fig. 4), the cutting off of the deep fascia and part of the levator ani allows the membranous urethra and prostate to be pulled into view by traction on the penis. The pubo-prostatic ligaments are now in plain view, and are made tense by our traction (Fig. 5). They appear to be about 1.5 or a centimetre long, and if they are both divided, the prostate will come still further into view. This partial destruction of the pelvic floor is permanent, and is of great value in preventing further compression of the prostatic urethra by the grasp of the levator ani. It also makes the bladder prolapse a little, so that there is no longer a retroprostatic pouch, but the orifice of the urethra becomes the lowest point.

I advised this much dissection (see my first paper) formerly, but I believe now it is well to cut the pelvic diaphragm supporting the prostate along both lateral borders. As soon as this is done, the whole mass, including prostate and neck of bladder, falls freely backward and downward, almost as if it were herniating into a new position. As this is the aim of the operation, it need cause no anxiety. The practical difficulty I have found was in making these lateral cuts without too profuse hæmorrhage. Theoretically, if the line of section is close to the capsule, we should get only small arterial branches unless we injure the artery of the bulb. The venous plexuses around the prostate and the numerous transverse branches caused so much trouble in two cases that I treated the lateral supports like the broad ligaments in hysterectomy. After the finger has made a small opening through the urogenital diaphragm, its ligamentous and muscular fibres can be held between the thumb and finger. The important vessels are close to this plane. From the operator's stand-point, it is much as if he were doing a hysterectomy and had the broad ligament in his grasp. I found a rapid and bloodless way to make the section was by applying broad ligament forceps, cutting between them and the prostate, and then using hæmodynamic sutures on the stumps. With the anterior vessels I have

had no trouble, since they can be seen and avoided. It seems desirable to avoid in all cases destruction of the dorsal arteries, veins, and nerves of the penis.

The operation of prostatolysis is complete when the side attachments of the prostate are divided (Fig. 5). It will be noticed that the organ falls not only more backward, but also nearer the perineal skin, like a prolapsed uterus, even forming a sort of rectocele to the touch. The wound should now be closed with only small capillary drains in the corners. The testes easily find their way into the loose dartos again. Little reaction or shock follows this operation. There is scarcely any danger of injuring bladder, rectum, or urethra in doing it.

Beside a great and lasting relief from the obstructive symptoms, a practical benefit patients get from this operation is relief from rectal spasm associated with dysuria. This comes from weakening the muscular floor, which merges with the anal sphincter externus. The levator ani fibres embrace the prostate. The latter is normally held in the grip of the muscle, and is both lifted and compressed by its contraction. When enlarged, this action becomes exaggerated, as the organ is increased in breadth, so that the muscular fibres of the pelvic floor are less parallel as they pass it, and hence the prostate is much more powerfully squeezed as they contract. The contraction of this muscle, which ordinarily lifts both the anus and prostate and assists in expulsion, now fails to lift the great tumor, and only squeezes it tighter together, while at the same time the anus is forced against it. In many cases the result of this is not only to compress the urethra and increase tenesmus, but to cause functional derangement of the anus and rectum, so that patients suffer acutely from rectal tenesmus every time the bladder is strained upon, and also suffer reflex vesical spasm whenever the rectum contracts. This combination of symptoms has probably been met by every one, and is not confined to cases with cystitis. Patients so affected often think they have piles, when in fact no tumors or proctitis are present.

Of course, another element in the rectal disturbance is

the backward pressure of the prostatic tumor higher up on the rectal wall, causing much the same symptoms as a retroflexed uterus. The only wonder is that all prostaties do not have this class of symptoms. As a matter of fact, a fair minority do have them.

The falling back of the prostate from this operation does not make further pressure on the rectum, because the bladder neck, rectum, and coccyx all are simultaneously released, and all move backward together from the cutting of the urogenital diaphragm in front. Every half-inch backward the prostate can go brings it into a wider space between the bones, and the general result is a great loosening up of all the structures concerned in pressure on the neck of the bladder.

A backward and downward displacement of the bladder outlet is a very valuable aid to urination, also, by abolishing the retroprostatic pouch of the bladder. This pouch forms by the sagging of the posterior wall behind the elevated prostate, which, from its firm anchorage to the rami, cannot descend. Relieving the prostate allows it to become again the lowest point, so that the *bas fond* is funnel shaped.

Evidence of the value of changing the position of the outlet is the permanent good results sometimes following drainage by suprapubic section. The real value of suprapubic cystotomy is in the effect it has of ventral fixation. This draws up the retroprostatic pouch, and even the prostate itself. It fails often of good result because it does not relieve the tension of the pelvic floor. The existence of this retroprostatic pouch is easily demonstrated in some individuals by passing the urine, first in a sitting, then in a standing, and last in a knee-chest or hand-and-knee posture. Certain patients can by this change evacuate a number of ounces more at once with each change of posture.

CONCLUSIONS.

1. The male pelvic outlet is a narrow bony ligamentous triangle, often too small for the senile prostate.
2. The overgrown prostate would not obstruct the blad-

der were it not compressed between the jaws of the pubic rami.

3. The triangular ligament and urogenital diaphragm hold the bladder neck and prostate immovably between these bones.

4. On cutting away these bands, the constricted overgrown mass falls back into a wider space, and ceases to be obstructed.

5. Incidentally, great relief of rectal reflexes and spasm results.

6. The retroprostatic pouch is abolished and the bas fond becomes a true funnel, with its outlet at the lowest point.

7. The author's technique is simple. He has borrowed one step, that of the deep hæmostasis, from vaginal hysterectomy.